

13584US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants: Fu *et al.* Examiner: To be assigned
Serial No.: 10/773,941 Group Art Unit: To be assigned
Filed: February 6, 2004
For: "Nano-Structured Zirconia Particles with High Thermal Stability"
Customer No.: 23719 Kalow & Springut LLP
488 Madison Avenue, 19th Floor
New York, New York 10022

April 13, 2004

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

INFORMATION DISCLOSURE STATEMENT

Sir:

Applicants submit herewith the following disclosure in accordance with the provisions of 37 C.F.R. §§ 1.97 and 1.98.

I. U.S. PATENT DOCUMENTS

<u>Patent No./Publication No.</u>	<u>Date Issued</u>	<u>Title</u>
5,252,316 to Kriechbaum <i>et al.</i>	October 12, 1993	Zirconium Oxide Powder, Process for Its Preparation and Its Use

Certificate of Mailing Under 37 C.F.R. 1.8

I hereby certify that this correspondence is being deposited on the date shown below with the United States Postal Service as first class mail with sufficient postage in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

<u>K Padilla</u>	<u>K Padilla</u>	<u>4/13/04</u>
(Signature)	(Printed Name of Person Signing Certificate)	(Date)

I. U.S. PATENT DOCUMENTS (cont.)

<u>Patent No./Publication No.</u>	<u>Date Issued</u>	<u>Title</u>
5,786,294 to Sachtler <i>et al.</i>	July 28, 1998	Crystalline Mesoporous Zirconia Catalysts Having Stable Tetragonal Pore Wall Structure
6,030,914 to Matsui	February 29, 2000	Zirconia Fine Powder and Method for Its Production
US 2001/0036437 to Gutsch <i>et al.</i>	November 1, 2001	Nanoscale Pyrogenic Oxides
6,511,642 to Hatanaka <i>et al.</i>	January 28, 2003	Porous Material, Catalyst, Method of Producing the Porous Material and Method for Purifying Exhaust Gas
US 2003/0125417 to Vanier <i>et al.</i>	July 3, 2003	Use of Nanoparticulate Organic Pigments in Paints and Coatings

II. FOREIGN PATENT DOCUMENTS

<u>Publication No.</u>	<u>Country</u>	<u>Publication Date</u>
EP 0 517 437	EPO	26 March 1997
WO 99/59754	WIPO	25 November 1999
WO 00/24676	WIPO	4 May 2000
WO 02/12123	WIPO	14 February 2002

III. NON PATENT PUBLICATIONS

- Yoldas, B., "Zirconium Oxides Formed by Hydrolytic Condensation of Alkoxides and Parameters That Affect Their Morphology," *Journal of Materials Science*, 21, pp. 1080-1086 (1986).
- Caruso, *et al.*, "ZrO₂ Phase Structure in Coating Films and Powders Obtained by Sol-Gel Process," *Journal of Sol-Gel Science and Technology*, 3, pp. 241-247 (1994).
- Moon, *et al.*, "Preparation of Monodisperse and Spherical Zirconia Powders by Heating of Alcohol-Aqueous Salt Solutions," *J. Am. Ceram. Soc.*, 78[10], pp. 2690-2694 (1995).

III. NON PATENT PUBLICATIONS (cont.)

- Matsui, *et al.*, "Raman Spectroscopic Studies on the Formation Mechanism of Hydrous-Zirconia Fine Particles," J. Am. Ceram. Soc., 78[1], pp. 146-152 (1995).
- Matsui, *et al.*, "Formation Mechanism of Hydrous-Zirconia Particles Produced by Hydrolysis of $ZrOCl_2$ Solutions," J. Am. Ceram. Soc., 80[8], pp. 1949-1956 (1997).
- Rivas, *et al.*, "Evolution of the Phase Content of Zirconia Powders Prepared by Sol-Gel Acid Hydrolysis," J. Am. Ceram. Soc., 81[1], pp. 200-204 (1998).
- Helble, J., "Combustion Aerosol Synthesis of Nanoscale Ceramic Powders," J. Aerosol Sci., vol. 29, No. 5/6, pp. 721-736 (1998).
- Hu *et al.*, "Nanocrystallization and Phase Transformation in Monodispersed Ultrafine Zirconia Particles from Various Homogeneous Precipitation Methods," J. Am. Ceram. Soc., 82[9], pp. 2313-2320 (1999).
- "Influence of Some Parameters on the Synthesis of ZrO_2 Nanoparticles by Heating of Alcohol-Aqueous Salt Solutions," Journal of Nanoparticle Research, 1:349-352 (1999).
- Xia *et al.*, " ZrO_2 Nanopowders Prepared by Low-Temperature Vapor-Phase Hydrolysis," J. Am. Ceram. Soc., 83[5], pp. 1077-1080 (2000).
- Matsui, *et al.*, "Formation Mechanism of Hydrous-Zirconia Particles Produced by Hydrolysis $ZrOCl_2$ Solutions: II," J. Am. Ceram. Soc., 83[6], pp. 1386-1392 (2000).
- Matsui, *et al.*, "Formation Mechanism of Hydrous Zirconia Particles Produced by the Hydrolysis of $ZrOCl_2$ Solutions: III, Kinetics Study for the Nucleation and Crystal-Growth Processes of Primary Particles," J. Am. Ceram. Soc., 84[101], pp. 2303-2312 (2001).
- Matsui, *et al.*, "Formation Mechanism of Hydrous of Zirconia Particles Produced by Hydrolysis of $ZrOCl_2$ Solutions: IV, Effects of $ZrOCl_2$ Concentration and Reaction Temperature," J. Am. Ceram. Soc., 85[3], pp. 545-553 (2002).
- Limaye, *et al.*, "Morphological Control of Zirconia Nanoparticles Through Combustion Aerosol Synthesis," J. Am. Ceram. Soc., 85[7], pp. 1127-1132 (2002).
- Deng, *et al.*, "New Hydrolytic Process for Producing Zirconium Dioxide, Tin Dioxide, and Titanium Dioxide Nanoparticles," J. Am. Ceram. Soc., 85[11], pp. 2837-2839 (2002).

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Information Disclosure Statement – Page 4

III. NON PATENT PUBLICATIONS (cont.)

Xie, Y., "Preparation of Ultrafine Zirconia Particles," J. Am. Ceram. Soc., 82[3], pp. 768-770 (1999).

Burton, et al., "Optimisation of the Preparation of Ceria/Zirconia Mixed Oxides by a Statistical Approach," www.zrchem.com/frames.html, undated, downloaded December 11, 2003.

"General Data Sheets on Zirconium Catalyst Products," www.zrchem.com/catalysisprods.html, undated, downloaded January 5, 2004.

"Zirconium Compounds in Catalysts," www.zrchem.com, November/December 1992.


"Sulfated Zirconia - A Catalyst Isomerisation Reactions," undated.

The items listed above are identified on the accompanying Form PTO 1449. A copy of each of the items other than those identified above as U. S. Patent Documents are also submitted with this statement.

Applicants take no position on whether any of the items cited above and listed on the accompanying Form PTO 1449 constitute prior art against the subject application under any particular provision of Title 35 of the United States Code.

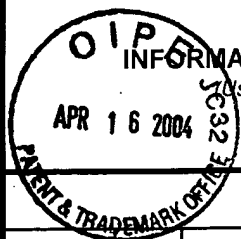
Because no action has been taken on the merits, Applicants submit that no fee is due at this time. However, if a fee is deemed necessary, please charge Deposit Account No. 11-0171.

Respectfully submitted,



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Attorney for Applicant

Kalow & Springut LLP
(212) 813-1600



INFORMATION DISCLOSURE CITATION

(Use several sheets if necessary)

ATTY DOCKET NO.

13584 US

SERIAL NO.

10/773,941

Millennium Inorganic Chemicals, Inc.

FILING

February 6, 2004

GROUP

to be assigned

U.S. PATENT DOCUMENTS

*EXAMINER INITIAL	DOCUMENT NUMBER	DATE	NAME	CLASS	SUBCLASS	FILING DATE IF APPROPRIATE
	5,252,316	10/12/1993	Kriechbaum et al.			
	5,786,294	7/28/1998	Sachtler et al.			
	6,030,914	2/29/2000	Matsui			
	US 2001/0036437	12/1/2001	Gutsch et al.			
	6,511,642	1/28/2003	Hatanaka et al.			
	US 2003/0125417	7/3/2003	Vanier et al.			

FOREIGN PATENT DOCUMENTS

	DOCUMENT NUMBER	DATE	COUNTRY	CLASS	SUBCLASS	TRANSLATION	
						YES	NO
	EP 0 517 437	26/03/1997	EPO				
	WO 99/59754	25/11/1999	WIPO				
	WO 00/24676	4/05/2000	WIPO				
	WO 02/12123	14/02/2002	WIPO				

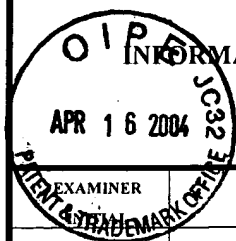
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)

		Yoldas, B., "Zirconium Oxides Formed by Hydrolytic Condensation of Alkoxides and Parameters That Affect Their Morphology," Journal of Materials Science, 21, pp. 1080-1086 (1986).
		Caruso, et al., "ZrO ₂ Phase Structure in Coating Films and Powders Obtained by Sol-Gel Process," Journal of Sol-Gel Science and Technology, 3, pp. 241-247 (1994).

EXAMINER

DATE CONSIDERED

*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609; Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.



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(Use several sheets if necessary)

Docket Number (Optional)

13584 US

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Applicant(s)

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"Influence of Some Parameters on the Synthesis of ZrO₂ Nanoparticles by Heating of Alcohol-Aqueous Salt Solutions," Journal of Nanoparticle Research, 1:349-352 (1999).

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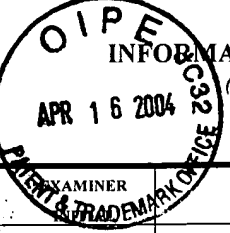
Matsui, et al., "Formation Mechanism of Hydrous of Zirconia Particles Produced by Hydrolysis of ZrOCl₂ Solutions: IV, Effects of ZrOCl₂ Concentration and Reaction Temperature," J. Am. Ceram. Soc., 85[3], pp. 545-553 (2002).

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		Applicant(s) Millennium Inorganic Chemicals, Inc			
		Filing Date February 6, 2004		Group Art Unit To be assigned	
		OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)			
		Deng, et al., "New Hydrolytic Process for Producing Zirconium Dioxide, Tin Dioxide, and Titanium Dioxide Nanoparticles," J. Am. Ceram. Soc., 85[11], pp. 2837-2839 (2002).			
		Xie, Y., "Preparation of Ultrafine Zirconia Particles," J. Am. Ceram. Soc., 82[3], pp. 768-770 (1999).			
		Burton, et al., "Optimisation of the Preparation of Ceria/Zirconia Mixed Oxides by a Statistical Approach," www.zrchem.com/frames.html, undated, downloaded December 11, 2003.			
		"General Data Sheets on Zirconium Catalyst Products," www.zrchem.com/catalysisprods.html, undated, downloaded January 5, 2004.			
		"Zirconium Compounds in Catalysts," www.zrchem.com, November/December 1992.			
		"Sulfated Zirconia - A Catalyst Isomerisation Reactions," undated.			
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